

REMARKS

Claim 60 is amended. Claims 60-62, 64 and 66 are pending in the application.

Claims 60-62, 64 and 66 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over a combination of Nguyen (U.S. Patent No. 5,356,722), Ikeda (U.S. Patent No. 5,593,741, and Wolf, Silicon Processing for the VLSI Era, Vol. 1, (1986), pp. 166-167. The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Claims 60-62, 64 and 66 are allowable over the cited combination of Nguyen, Ikeda and Wolf for at least the reasons that the references, individually or as combined, fail to disclose or suggest each and every element of any of the claims and fail to provide a reasonable expectation of success.

As amended, independent claim 60 recites a method of depositing SiO₂ in a cold-wall CVD reactor utilizing an rf power of 600W, a temperature of about 400°C, a TEOS flow rate of 975 sccm, an O₂ flow rate of 600 sccm without passing through an ozone generator, and flowing He into the reactor at 775 sccm. Claim 60 additionally recites feeding gaseous H₂O₂ into the chemical vapor deposition reactor and decomposing the TEOS to form SiO₂ at a pressure of from about 10 Torr to about 80 Torr. The amendment to claim 60 is supported by the specification at, for example, page 11, lines 9-20. The Examiner indicates reliance upon Nguyen at column 4, lines 33-46 (table) for various conditions including rf power, temperature and flow rates. Applicant notes that such table is specifically indicated as specifying conditions appropriate for forming a nitrogen-containing

layer which will underlie an eventual silicon oxide layer. The conditions utilized for depositing silicon oxide are specified at column 4, lines 51-59. These conditions include a He/TEOS flow of 1,000-5,000 sccm. Such disclosure does not teach or suggest the claim 60 recited TEOS flow of 975 sccm and the recited He flow of 775 sccm.

Further, Nguyen specifically indicates that the conditions are set forth for TEOS/ozone/oxygen processes and indicates providing an ozone generator such that ozone is fed into the reactor at a flow rate of 1,000-6,000 sccm (at a concentration of 5-13% in O₂). Accordingly, the parameters disclosed by Nguyen for SiO₂ deposition utilizing ozone do not fairly teach or suggest the claim 60 recited combination of flow rate and other parameters where O₂ is provided without passing through an ozone generator.

The Examiner indicates that the deposition pressures disclosed by Nguyen overlap those recited in claim 60. However, the relied upon "pressure of from about 5-15 Torr" disclosed at column 4, table lines 33-46 are those Nguyen sets forth for utilization during deposition of a nitrogen-containing film. In contrast, referring to Nguyen and lines 53-54, such specifically indicates that the pressure during deposition of the non-nitrogen silicon oxide layers is from 500 Torr through atmospheric pressure. Accordingly, when applicant's claims are interpreted in light of the specification which is clearly directed toward SiO₂ films, the Nguyen disclosure does not contribute toward suggesting the claim 60 recited depositing SiO₂ at a pressure of from about 10 Torr to about 80 Torr.

As acknowledged by the Examiner at page 4 of the present action, Nguyen does not disclose or suggest the claim 60 recited H₂O₂. The Examiner indicates reliance upon Ikeda as disclosing use of H₂O₂ during deposition of SiO₂. However, referring to Ikeda at example 5, applicant notes that such discloses use of hydrogen peroxide with specific

indication of a TEOS flow rate of 50 sccm, rf power of 100W, a pressure of 1 Torr and a temperature of 350°C. Additionally, Nguyen discloses that the hydrogen peroxide gas is utilized with ozone-oxygen gas. Accordingly, the Ikeda disclosure of parameters during utilization of H₂O₂, and the use of a combination of H₂O₂ and ozone during silicon oxide deposition, does not contribute toward suggesting the deposition parameters recited in claim 60 or the recited combination of feeding gaseous H₂O₂ while providing O₂ into the reactor at 600 sccm without passing through an ozone generator. Accordingly, claim 60 is not rendered obvious by the combination of Ikeda and Nguyen and is allowable over these references.

At page 4 of the present Action the Examiner indicates reliance upon Wolf as disclosing/defining a “cold-wall” reactor. Such disclosure does not teach, suggest or contribute to the claim 60 recited parameters or the recited combination of providing H₂O₂ and providing O₂ without passing through an ozone generator, which are not taught or suggested by the combination of Nguyen and Ikeda. Accordingly, the combination of Ikeda, Nguyen and Wolf fails to disclose or suggest each and every element in claim 60. Further, when considered in combination, the set of parameters for silicon oxide deposition disclosed by Nguyen and the drastically differing parameters disclosed by Ikeda do not provide a basis for a reasonable expectation of successfully achieving the claim 60 recited SiO₂ deposition utilizing the set of parameters recited in such claim. Claim 60 is therefore not rendered obvious by the cited combination of Nguyen, Ikeda and Wolf and is allowable over these references.

Dependent claims 61-62, 64 and 66 are allowable over Nguyen, Ikeda and Wolf for at least the reason that they depend from allowable base claim 60.

For the reasons discussed above, claims 60-62, 64 and 66 are allowable. Accordingly, applicant respectfully requests formal allowance of such pending claims in the Examiner's next action.

Respectfully submitted,

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